

Unlocking Potential: Speeding up with Autostore

Autostore Developments since last Logistics
Summit Masterclass presentation about High
Performance in 2023



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Agenda

- Router Software launch 2020
- Latest Incremental improvements
- Case Studies
- Forecast & focus areas



Router Software launch 2020

After years of internal Product Development

+ 40%

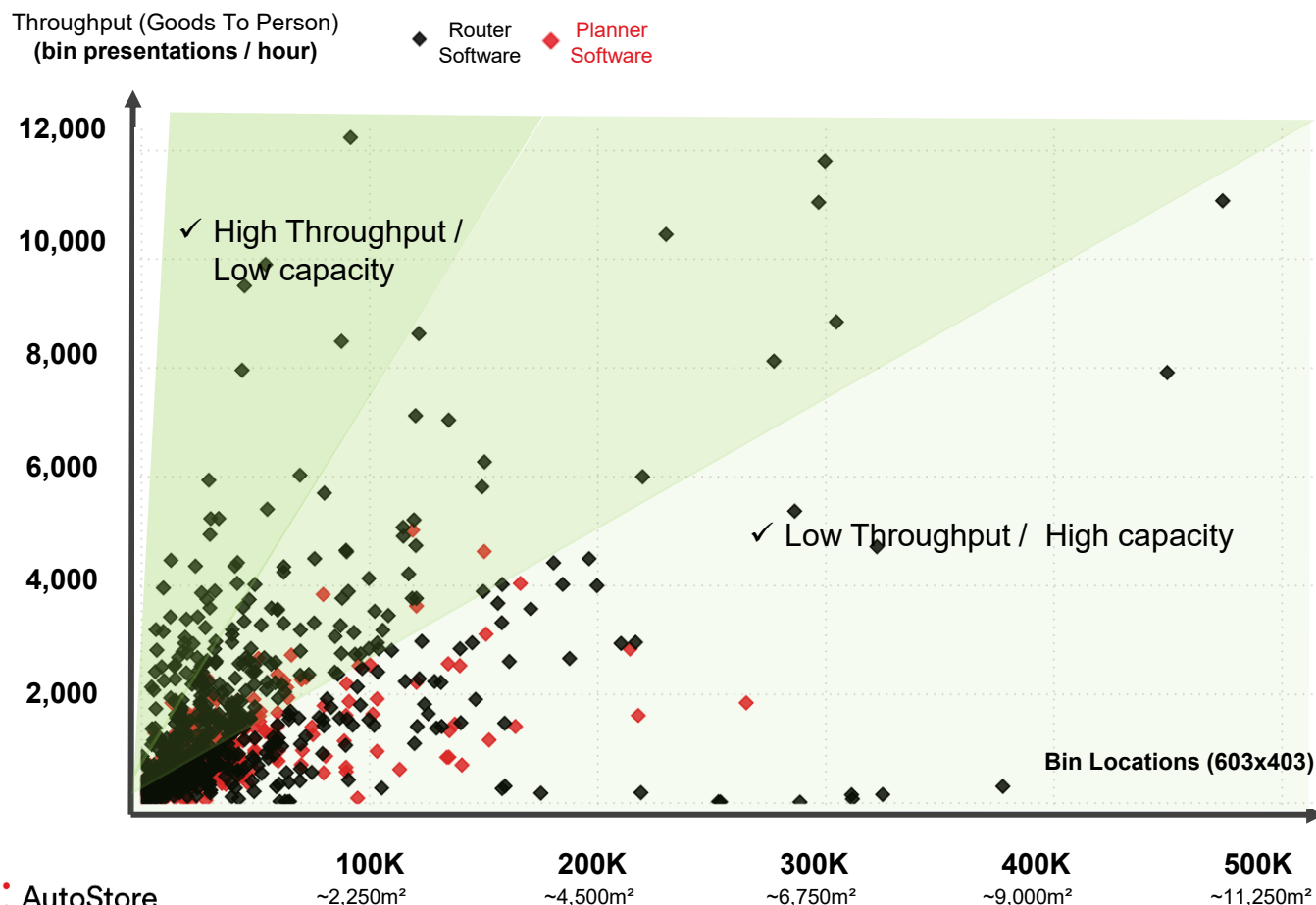
Robot Efficiency

4x

Throughput per Grid

2x

Robots per Grid



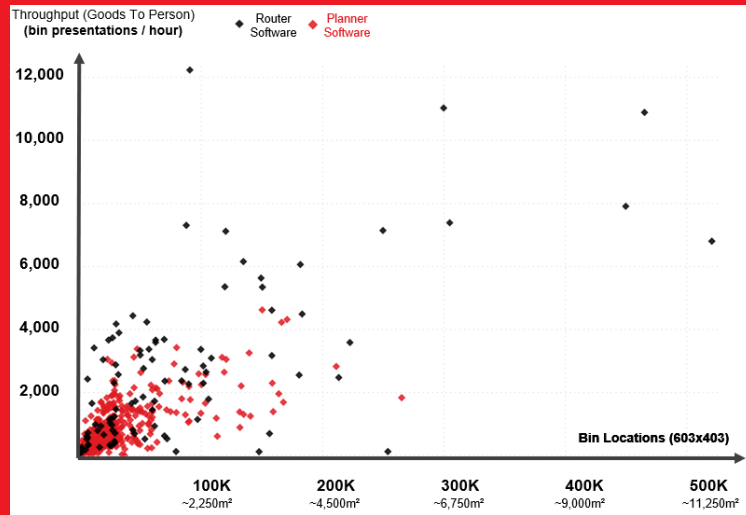
- Optimized Robot allocation and Route selection
- Dynamic Route Planning (not static anymore)
- Recalculates optimal routes for all Robots – EVERY SECOND
- 100 x more time to optimize compared to Planner
- Optimization is based on current traffic situation
- Full overview on next jobs allows to choose always best positioned Robot
- Improved travel distances per robot
- Waiting times per robot decreased by half the time
- Robot Performance up to 58,5 bins/h/robot
- Less than 15 stacks per robot



Router software ratio

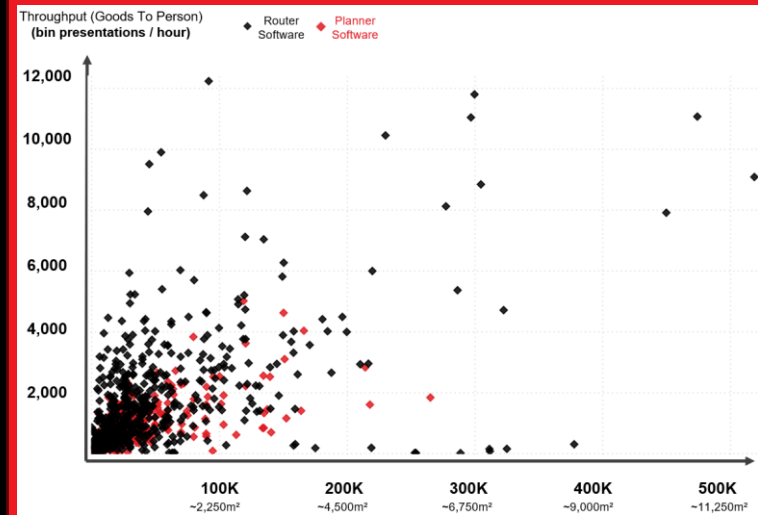
Recent migrations from Planner to Router / rapid increase of Autostore sites

~1,000 Grids



2023

~1,800 Grids



2025

02

Incremental Improvements



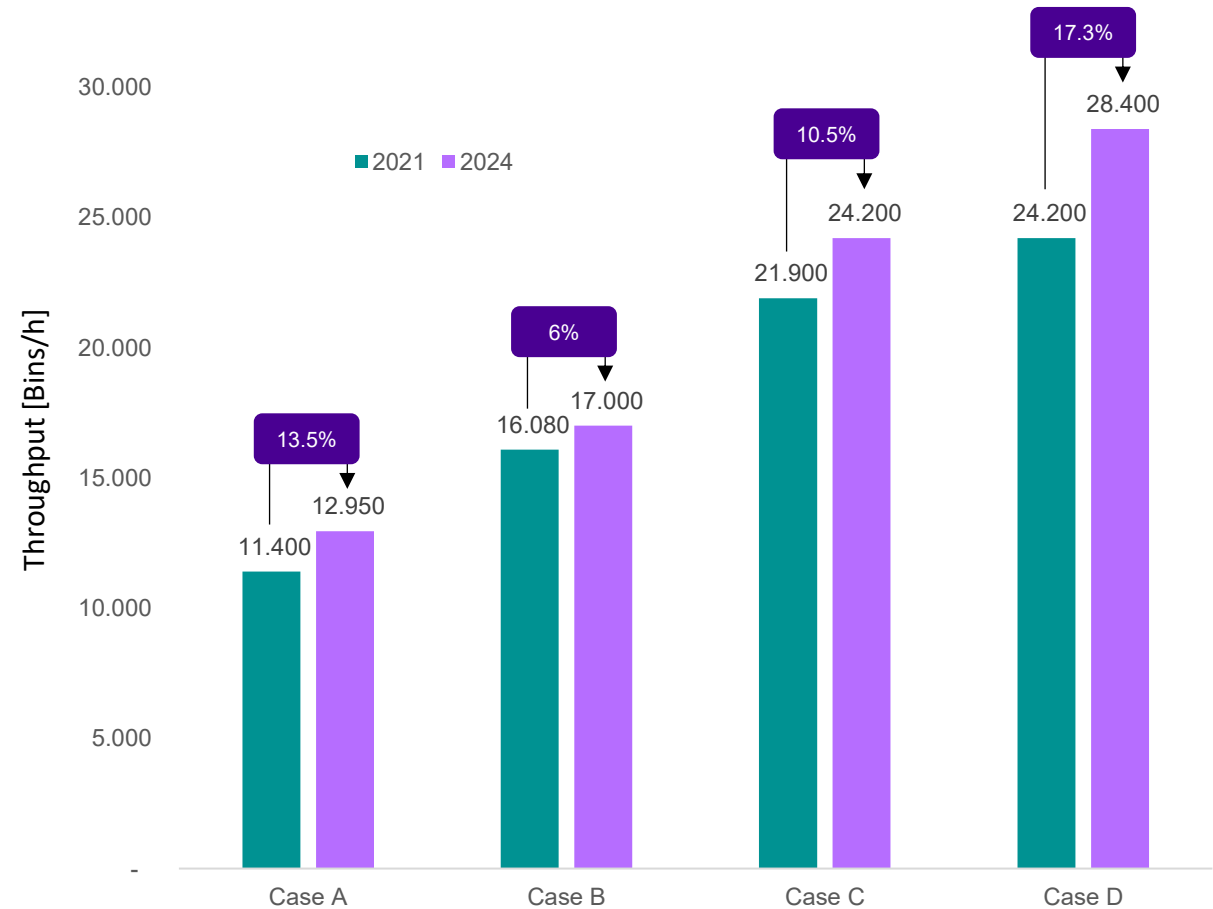
Router drives new potential

Continuous development that drives increasing performance over time, **especially for High Throughput Applications.**

This means systems will keep increasing potential for every release of Router.

No “Software-Retrofit” migration project required > seamless updates

Impact of Router development since 2021



Fastest technology per sqm through software improvements

Cube control software includes Router and X-Handler among others.

High focus over the last years on supporting high throughput applications and very large Grids.

R&D's constant work on continuous improvements is measured across KPI's like uptime and performance.

**Router improvements for
performance increase since 2021**

+26%

**X-Handler improvements for
reliability optimization since 2021**

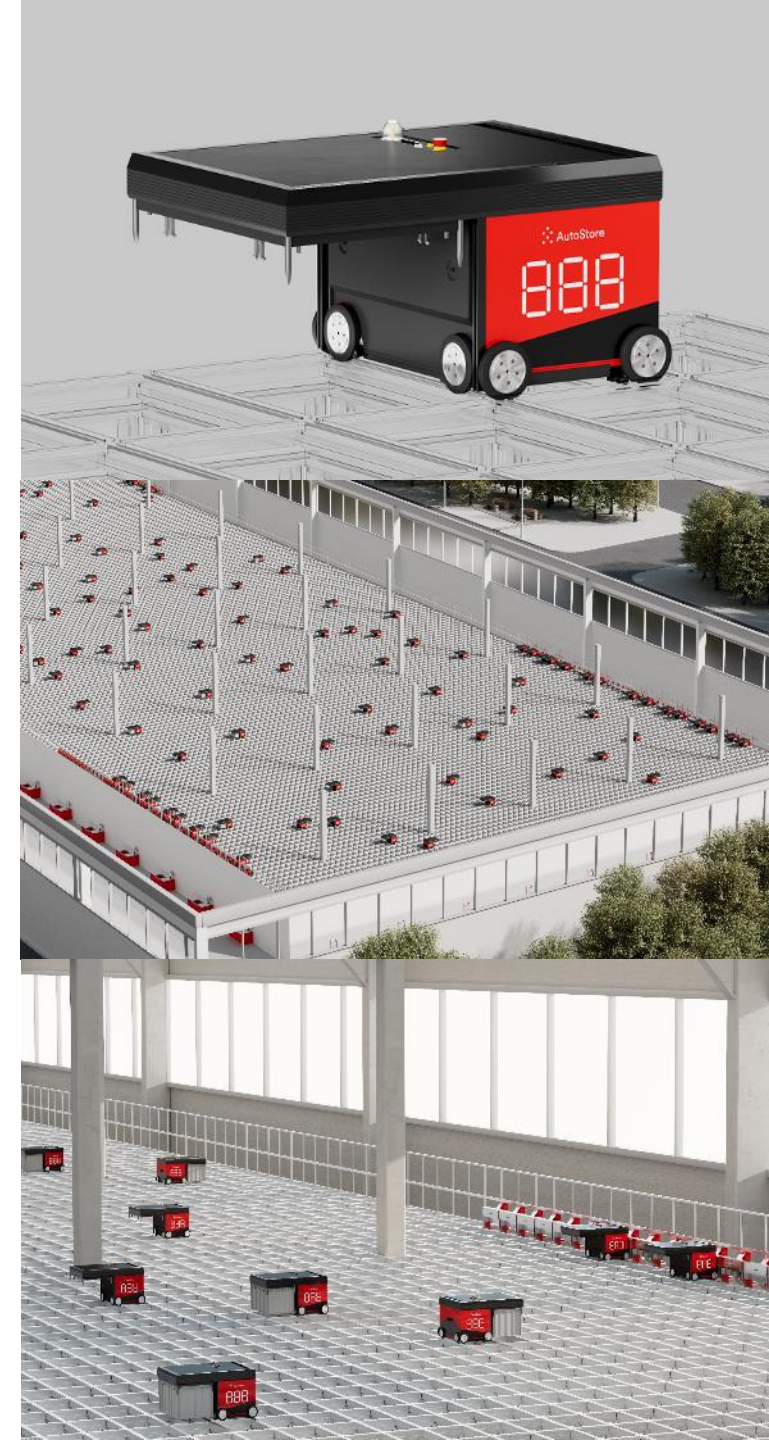
+83%

R5 Pro™

Drastically reduce the amount of chargers needed to maintain and increases battery life on all sites.

Amplify your ability to provide a premium customer experience while ensuring profitability.

- Achieve a remarkable improvement of **14% higher productivity per Robot** on >16h systems.
- Install up to **86% fewer chargers** and save on costs and installation & **maintenance efforts**.
- Create a surplus of up to **9% more space for products**.



03

Case Studies



The extensions of the AutoStore system at Bergfreunde.de



Empowered by Element Logic

Fashion/Outdoor- e-Commerce

Location

Rottenburg, Germany
AutoStore on 9.120 m²



"Expanding an AutoStore system is extremely easy. In this specific case, we connect the two storage units either via a conveyor system or directly via the grid."

-Thomas Klein, Head of Fulfillment, Bergfreunde.de

80.000 Bins
36 Robots
9 Carousels

+ 28.000 Bins
+ 10 Robots
+ 3 Carousels

+ 20 Robots
+ 6 Carousels
+ Carton Erector
+ Carton Closing

+ 52.000 Bins
+ 32 Robots
+ 6 Carousels

+ 30.000 Bins
+ 30 Robots
+ 1 Carousels
+ Conveyor, Erector
& Closing

+ 30.000 Bins
+ 0 Robots
+ 4 Transfer Cells
(Grid connection
through firewall)

+ 40.000 Bins
(new Grid)
+ 15 Robots

+ 25.000 Bins
+ 35 Robots
+ 12 Ports

2016

2017

2018

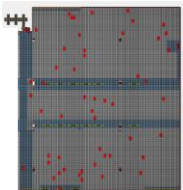
2020

2021

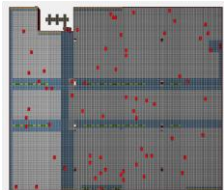
2022

2023

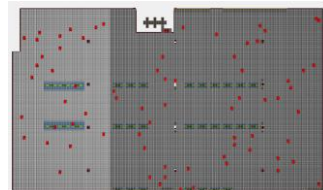
2024



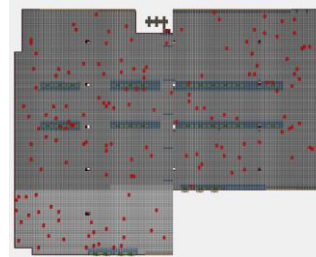
Pick & Pack to
Trolley



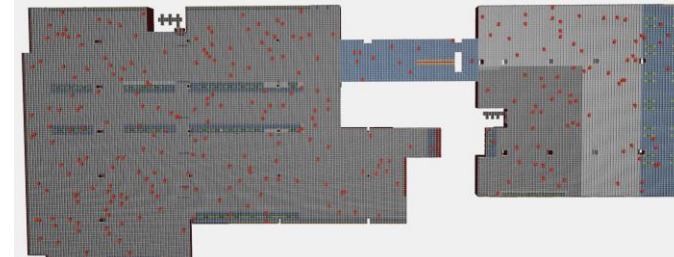
Pick & Pack to
Conveyor System



Pick & Pass to
Conveyor System



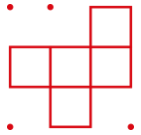
Migration from
Planner to Router



***In 2016, the Bergfreunde were ranked No. 11
in their market segment – 2023 they ranked No. 1.***

**Total figures
(after 24
expansions):**
305.000 Bins
301 Robots
82 Ports
~ 9,120 sqm

Move Your System Anywhere You Wish



- **Relocation made easy:** AutoStore™ is a free-standing structure, making disassembly and relocation feasible and cost-effective.



- **Leverage existing modules¹:**

- Grid
- Robots
- Bins
- Ports
- Controller
- Chargers
- Service Vehicle Unit
- Service Wall



- **Keep it for the future:** Save the old Grid framework² for later and reduce the delivery lead time for your next expansion.

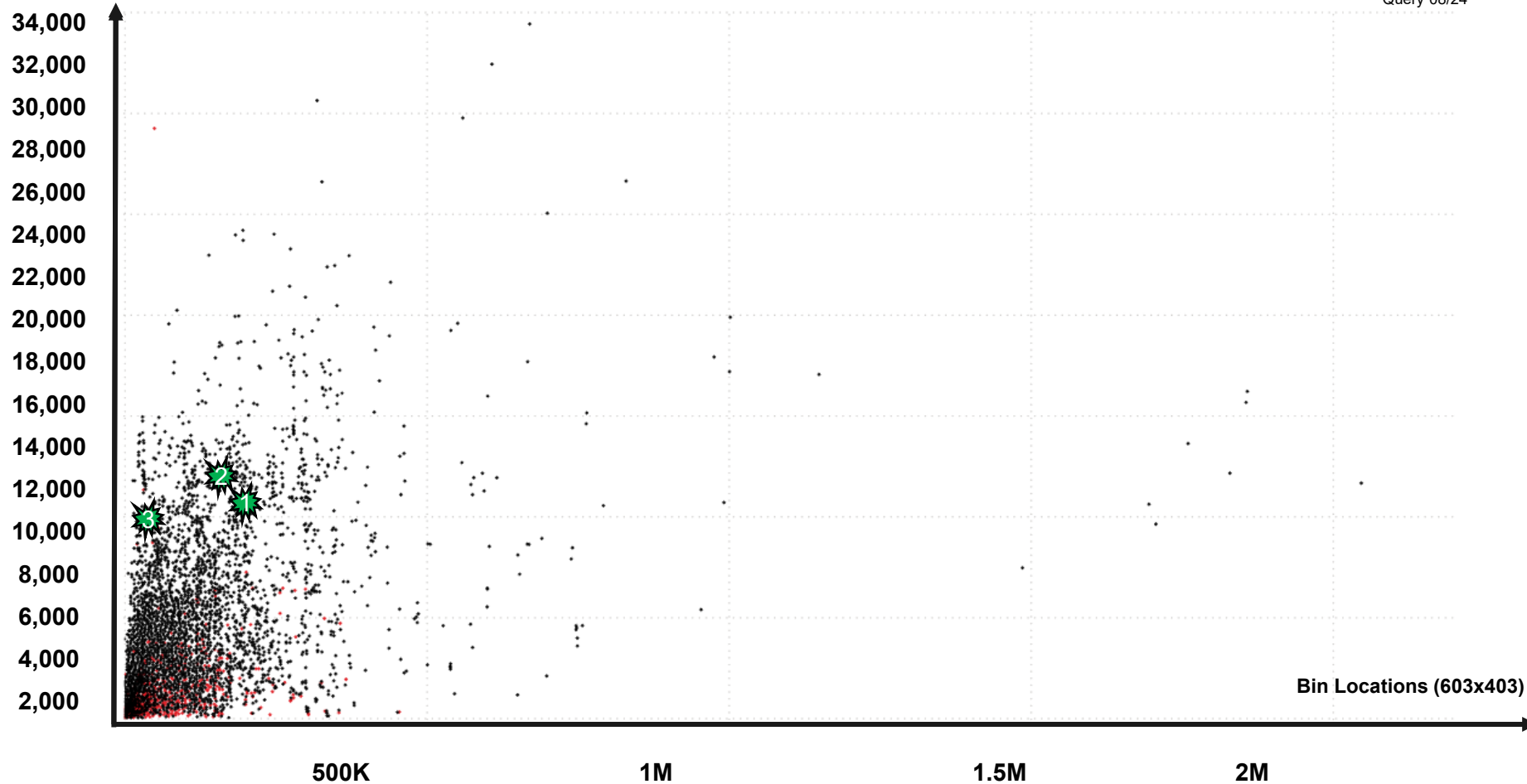


Case studies – 3 recent implementations out of simulated concepts

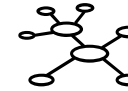
Throughput (Goods To Person)
(bin presentations / hour)

◆ Router Software ◆ Planner Software

Query 08/24



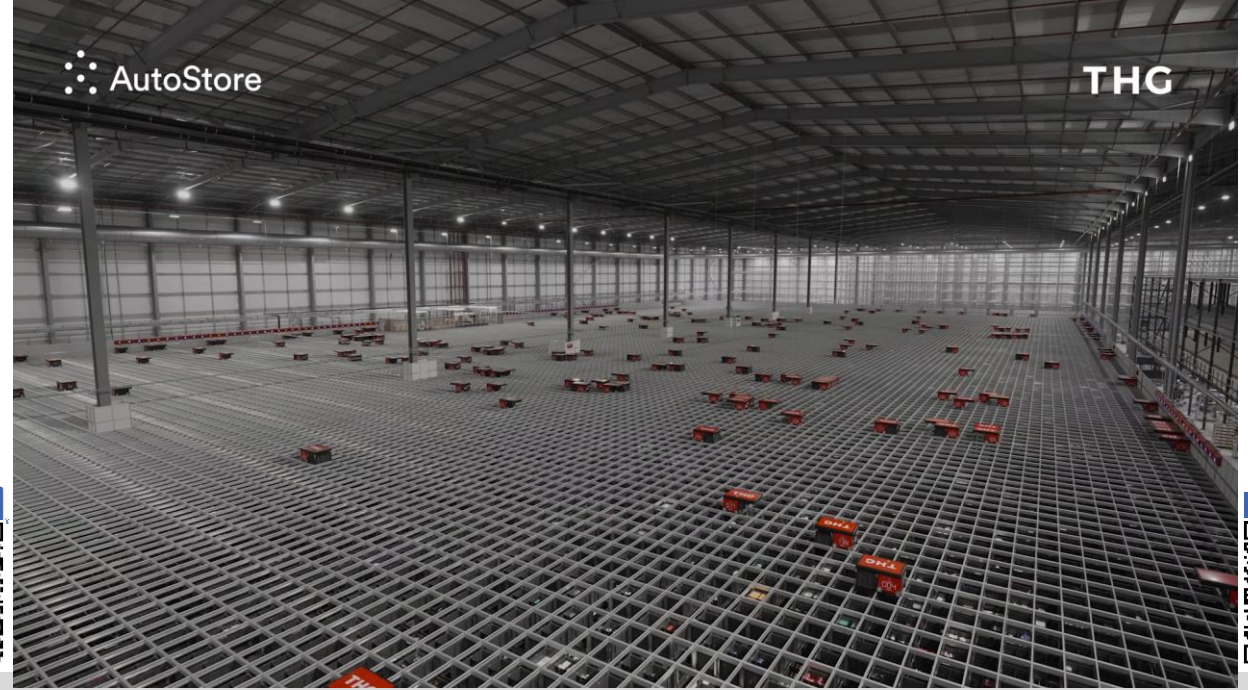
Increasing Throughput
AutoStore is increasingly requested and designs for customers that require 5-digit throughputs.



Larger systems
Requirements for even larger static capacity is pushing the boundaries in system size.



Shift towards high turnover
While there is adoption in all three shaded areas, high throughput/low capacity is gaining traction over proportionally.



Average Uptime: **99,4%**
Average MTBF: **93 days**



The Hut Group

Implemented by Element Logic in 2021



Luxury– Cosmetics

Location

Manchester, UK

Bins / Type / SKU

300,000 Bins / 330 mm / 97,000 SKUs

Robots

380 R5

Ports

56 Carousel, 13 Conveyor Ports

WMS

Customer WMS

Inbound

175 Bins/h – 14 hours/day

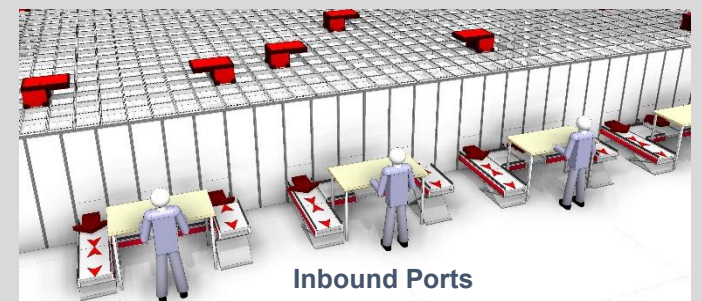
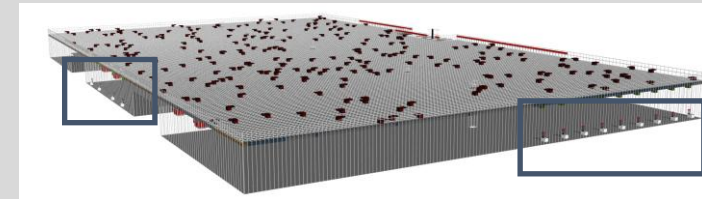
Outbound Peak

11,790 Bins/h – 3 shifts /day

5.7 Orderlines

Grid size: **8,200 sqm**

Amortization: **< 2 years**



Inbound Ports



Average Uptime: **99,7%**

Gride size: **8,000 sqm**

Rhenus Logistics

Implemented by Kardex in 2025



Retail B2B and B2C

Location	Hörselgau, GER
Bins / Type / SKU	240,000 Bins / 330 mm / >100,000 SKUs
Robots	531 R5
Ports	90 Carousel
WMS	Avion and Kardex KCC
Inbound	900 Bins/h – 2 shifts/day
Outbound Peak	13.000 Bins/h – 2 shifts/day
Order structure	3,2 Orderlines
Additional supply	2,5 km conveyor, packing area ...





Average Uptime: **99.6%**
Gride size: **~6,000 sqm**



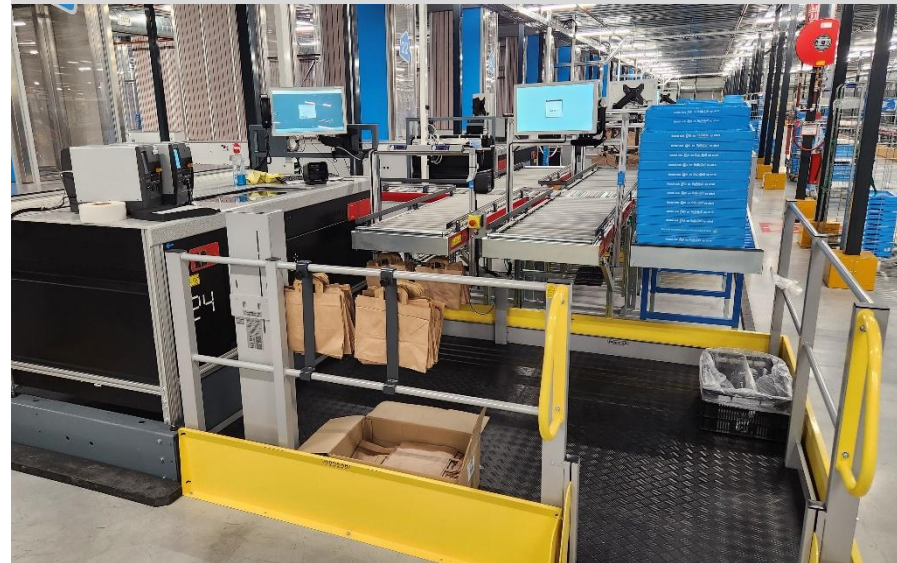
Albert Hijn, Ahold

Implemented by Swisslog in 2022



eGrocery

Location	Barendrecht, NL
Bins / Type / SKU	45,000 Bins / 330 mm / ~ 20,000 SKUs
Robots	312 R5
Ports	24 Relay, 16 Conveyor, 2 Carousel Ports
WMS	SynQ (Swisslog)
Inbound	900 Bins/h
Outbound Peak	10.500 Bins/h
Additional supply	Bin Washing street (4 transfer cells)
Ramping Up	Piece Pick Robotics



04

Forecast & Focus Areas



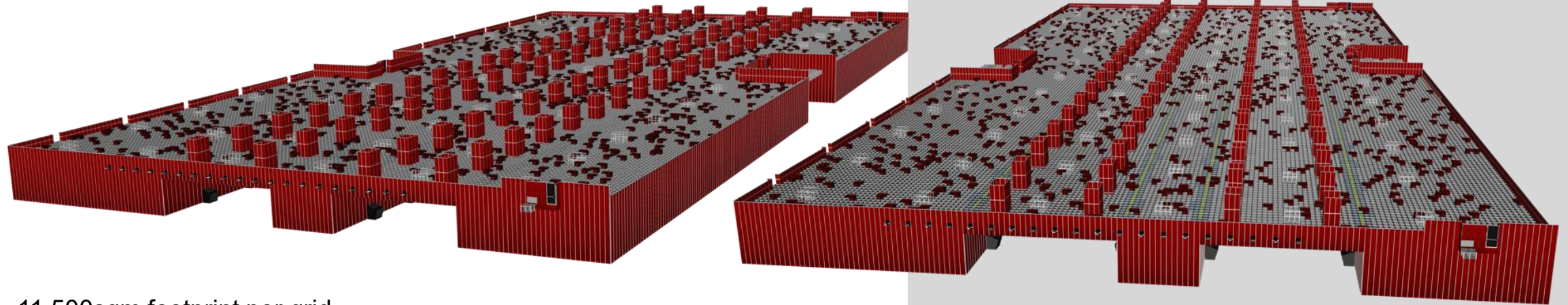
The fastest AutoStore goes live in 2026

Partner

FORTNA

Total Performance

46,000 Bins/hr



~ 11,500sqm footprint per grid

Site Specifications



Fast Fashion



2x 1,080 R5 Pro



2x 250,000 Bins



2x 72 FusionPorts
2x 40 Transfer Cells



Eastern Europe

High Throughput enablement by incremental improvements

Scalability

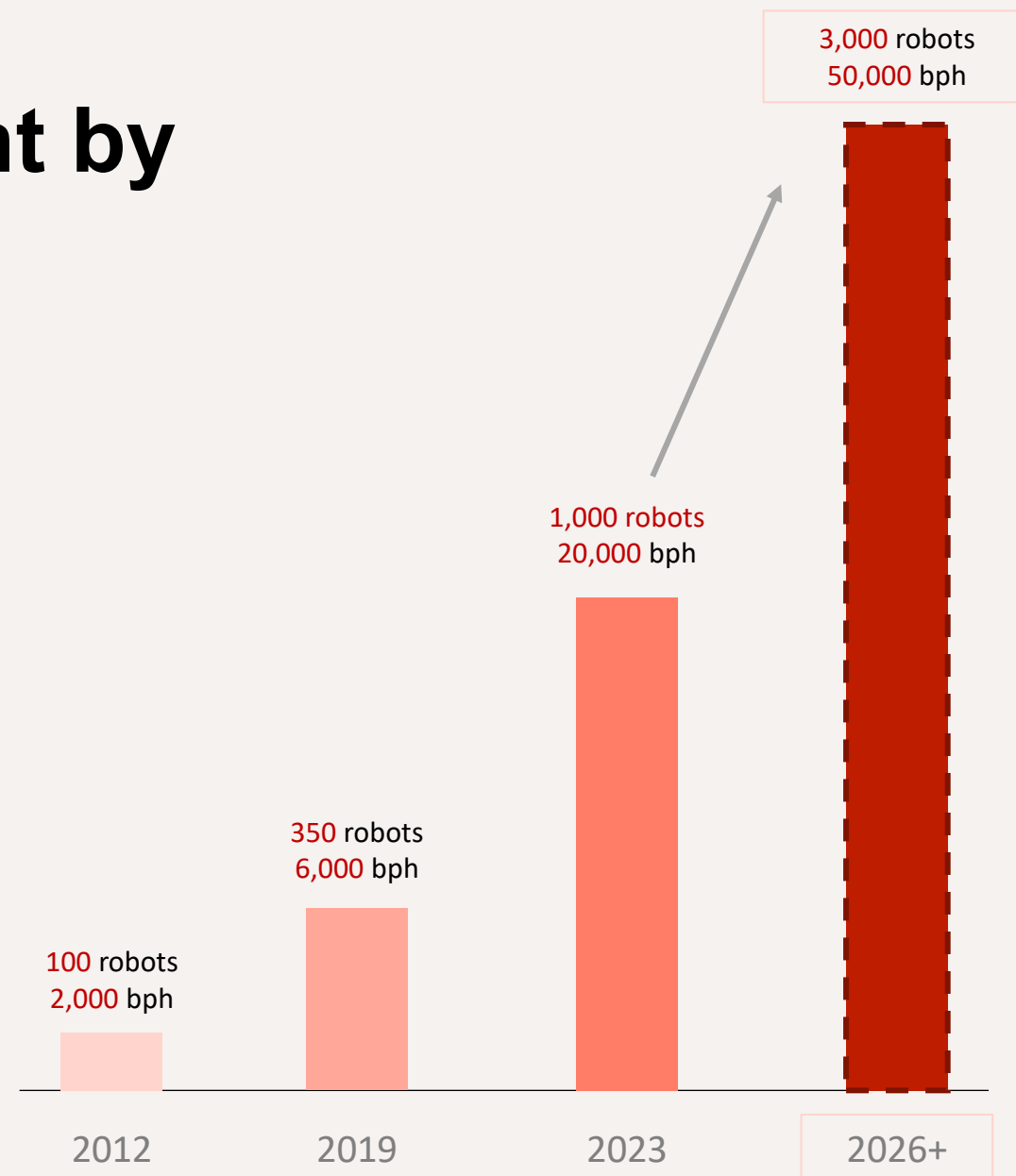
Enables customers to build large installations without additional complexity. Further optimization of the software ensures high robot utilization, resulting in lower costs per pick.

Reliability

Maintaining and optimizing MTBF and uptime in large AutoStore installations. No single point of failure means that AutoStore is fail-safe and minimizes costly system downtime in large installations.

Sequencing

The consolidation of multiple bins for one order takes place within the system in order to reduce complexity outside the cube.



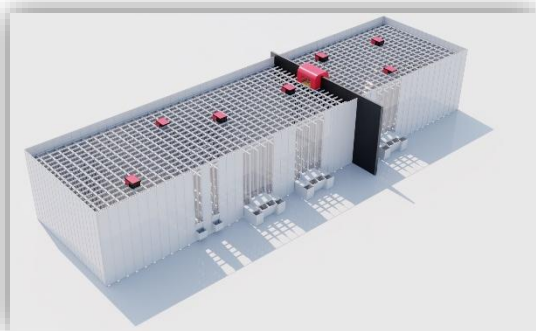
Long term Product Roadmap focus on strategic growth areas

MFC and High Throughput, with support for ease of integration of AutoStore in complex and highly automated solutions

MICRO- FULFILLMENT

«AutoStore in-a-box»

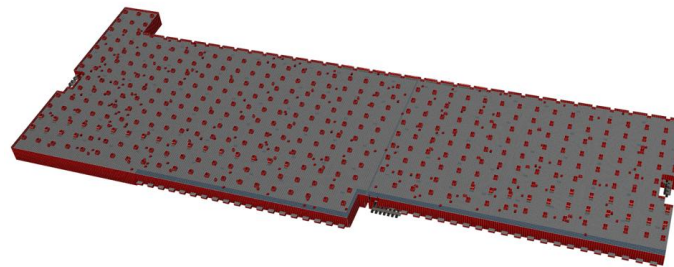
Enable Grocers with a space efficient end-to-end standard solution (hw/sw) to fulfill online grocery orders at urban locations, allowing customer pickup.



HIGH THROUGHPUT (LARGE INSTALLATIONS)

«5 M Bins and 3,000 Robots»

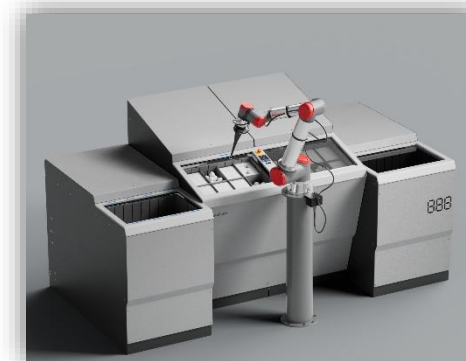
Provide the technical support to allow our largest customers continue extending their systems, while maintaining our key selling points: consolidation, reliability and safety.



SYSTEM INTEGRATIONS

«Easy-to-integrate AutoStore»

Create the necessary interfaces for partners and other vendors to integrate AutoStore in complex and highly automated environments.



AutoStore's Value Proposition

How we conquer the ASRS market

1. Ultra fast. Order completion in less than 3.5 minutes
2. Unrivalled reliability. Standardized components + software.
3. Rapid time to market. Fast to design & deploy = short amortization period / good ROI.
4. Highest-density storage technology up to 17.5m
5. Lean operating principles:
 - Sequencing executed inside the Cube reduces need for downstream processes.
 - All Bins can go to all Ports.
6. Scalability: Grow with your business !

Webinar

Unlocking Potential: Speeding Up Fulfillment with Autostore



Any questions?



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